

- 13 -

CLAIMS:

1. A screw plug of metallic material for a fluid line, in particular for an oil line or oil tank, having a cylindrical shank (36), comprising an external thread (22), on a top plate (12) in which a blind hole (28) of polygonal cross section is provided centrally as a receiving member for a tool,

10 characterised in that

the shank (36) takes the form of a tube stub (14) provided with the external thread (22) and from the end face (16) of the shank there extends a blind hole (18) which is coaxial with the blind hole (28) in the top plate (12).

2. A screw plug, characterised by a bevelled portion (24) inclined axis-wards from the top plate (12) as transition to the shank (36), wherein the tube-ward foot contour (25) of the bevelled portion constitutes an inner starting line for the external thread (22) projecting radially beyond this contour.

25 3. A screw plug according to claim 2, characterised in that the bevelled portion (24), widening towards the top, of the screw plug (10) forms an angle (w), in longitudinal section, with the longitudinal axis (A) of the screw, which angle preferably measures around 30°.

- 14 -

4. A screw plug according to claim 2 or claim 3, characterised by a diameter (g) of the foot contour (25) of the bevelled portion (24) of 19.5 mm.

5 5. A screw plug according to any one of claims 1 to 4, characterised in that the deepest point (20) of the blind hole (18) in the tube stub (14) exhibits a cross-section inclined from the wall surface (19) thereof to the longitudinal axis (A) of the screw.

10

6. A screw plug according to claim 5, characterised by a depth (c) of the wall surface (19) of around 8 mm, in particular of 7.8 mm.

15 7. A screw plug according to any one of claims 1 to 6, characterised by a diameter (e) of the blind hole (18) of around 14 mm and an external diameter (f) of the external thread (22) of around 21 mm, in particular of 13.8 mm and 20.97 mm respectively.

20

8. A screw plug according to any one of claims 1 to 7, characterised in that there is associated with the tube edge (16) at least one bevelled edge (15 or 17) inclined away therefrom towards the top plate.

25

9. A screw plug according to claim 8, characterised in that a bevelled edge (15, 17) inclined away from the tube edge towards the top is associated in each case on both sides with the tube edge (16).

30

10. A screw plug according to claim 9, characterised in that the outer bevelled edge (17) develops into the external thread (22).

11. A method of producing a screw plug according to at least one of claims 1 to 10, characterised in that a blank (34) with a cylindrical tube stub (36) formed on and adjoining a top plate (12) is produced, whose internal diameter (e_1) and external diameter (f_1) are smaller than the corresponding diameters (e, f) intended for the screw plug (10), and in that the tube stub (36) of the blank is expanded by exerting pressure on the inner wall surface (19_a) of the blind hole (18_a) thereof.
10
12. A method according to claim 11, characterised in that a portion (52) of a plunger (50) of larger cross-section than the internal diameter (e_1) of the blind hole (18_a) in the tube stub (36) of the blank (34) is introduced into said blind hole as a mandrel-type tool and the tube stub is expanded radially thereby.
15
13. A method according to claim 11 or claim 12, characterised in that the outer surface (38) of the tube stub (36) is forced out radially beyond the foot contour (25) of a bevelled portion (24) adjoining the top plate (12) and inclined cross-sectionally axis-wards.
20
14. A method according to any one of claims 11 to 13, characterised in that an external thread (22) is formed in the outer surface (38) of the expanded tube stub (36).
30
15. A method according to claim 13 or claim 14, characterised in that the external thread (22) is

- 16 -

formed in the area of the tube stub (36) determined in the axis-ward direction by the foot contour (25) of the bevelled portion (24).

- 5 16. A method according to claim 14 or claim 15, characterised in that the external thread (22) is formed in the outer surface (38) of the tube stub (36) by the thread rolling method.
- 10 17. A method according to claim 14 or 15, characterised in that the outer surface (38) of the tube stub (36) is pressed against a die surrounding it.
- 15 18. A blank for producing a screw plug (10) according to at least one of claims 1 to 10, in particular for the method according to any one of claims 11 to 17, characterised in that the top plate (12) of the blank (34) is adjoined by a cylindrical tube stub (36) with an external diameter (f_1) and a diameter (e_1) of the blind hole (18_a) whose dimensions are smaller than those of the external diameter (f) and hole diameter (e) of the screw plug (10).
- 20 19. A blank according to claim 18, characterised in that the external diameter (f_1) of the tube stub (36) on the blank (34) is smaller than the foot diameter (g) of the bevelled portion (24) on the screw plug (10).
- 25 20. A blank according to claim 19, characterised in that the bevelled portion (24) of the blank (34) forms an angle (w) with the longitudinal axis (A) of the blank which preferably measures around 30° .

- 17 -

21. A blank according to claim 18 or claim 19, characterised by a diameter (e_1) of the blind hole (18_a) of around 12 mm and an external diameter (f_1) of the tube stub (36) of around 19 mm, preferably of 19.2 mm.
22. A blank according to any one of claims 18 to 21, characterised in that a bevelled edge (15_a, 17_a) inclined away from the tube edge is associated in each case on both sides with the tube edge (16_a) of the tube stub (36).
23. A blank according to claim 22, characterised in that the outer bevelled edge (17_a) of the tube stub (36) develops into the cylindrical outer tube surface (38).
24. A tool for producing a screw plug (10) according to at least one of claims 1 to 10, characterised in that a plunger (50) is fixed at one end in a housing (42) as a mandrel-type tool and the free end thereof is associated with a carrying or holding head (68) arranged movably relative thereto and having a receptacle for a blank (34), wherein the axis (A) thereof extends in the central axis (M) of the tool (40) or the plunger.
25. A tool according to claim 24, characterised in that a stationary base plate (44) is associated with the bush-like housing (42) at the end remote from the carrying or holding head (68), which base plate forms an abutment for the plunger (50) seated thereon.

- 18 -

26. A tool according to claim 24 or claim 25,
characterised in that the free end of the plunger (50)
partially surrounded by a plunger tube (54) engages in
a central bore (70) in the carrying or holding head
5 (68), wherein a pressure head (52) of the plunger
projects axially beyond the edge (56) of the mouth of
the plunger tube.

27. A tool according to claim 26, characterised in that
10 the plunger tube (54) is seated at its other end,
preferably with a flange foot (57), on a stationary
upright sleeve (48) of the tool (40), which forms a
bearing surface for the plunger (50) passing through
the upright sleeve.

15

28. A tool according to any one of claims 25 to 27,
characterised by a disk-like central pressure base
(46) of the base plate (44) as an abutment for the
plunger (50) and the upright bush (48).

20

29. A tool according to any one of claims 24 to 28,
characterised in that the carrying or holding head
(68) is seated on a slide bush (60), which is
associated coaxially with the plunger (50) and the
25 upright bush (48).

30. A tool according to claim 28 and claim 29,
characterised in that the diameter (q_1) of the
pressure base (46) approximately matches the diameter
30 seated thereon of the slide bush (60).

31. A tool according to claim 29 or claim 30,
characterised in that, on a foot portion (64_t)

- 19 -

associated with the pressure base (46), the slide bush (60) comprises a head portion (64) wider radially than said foot portion.

5 32. A tool according to any one of claims 29 to 31, characterised in that the slide bush (60), with the holding head (68), is surrounded supportingly by a guide chuck (80) and arranged to be axially movable therewith relative to the housing (42).

10

33. A tool according to claim 25 and claim 32, characterised in that an energy storing device (78) is arranged between the base plate (44) and the guide chuck (80).

15

34. A tool according to claim 33, characterised in that the energy storing device takes the form of a profile element (78) of resilient material.

20 35. A tool according to claim 33 or claim 34, characterised in that the energy storing device or profile element (78) is positioned in the manner of a ring around the pressure base (46) of the base plate (44).

25

36. A tool according to any one of claims 24 to 35, characterised in that the blank (34) seated in the carrying or holding head (68) is arranged so as to be forceable, on axial movement thereof, onto the pressure head (52) of the plunger (50), wherein the diameter thereof is larger than the diameter (e_1) of the blind hole (18_a) in the blank.

30